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ABSTRACTS
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(Pages refer to the Japanese originals of this volume unless otherwise noticed)

On the Fermentative Degumming of Waste Silk. Part IV.

Enzymic action of Degumming Bacteria (Bacillus cereus sp.)
upon Sericin and Fibroin.

(pp. 243~247)

By Hideo KATAGIRI and Toshio NAKAHAMA.
(Agr. Chemical Laboratory, Kyoto Imperial University and Kanebo
Silk Factory: Received Dec. 17, 1937.)

The active centre of Bacillus cereus was concluded to be the soluble enzyme named "degummase", since the clear filtrate of the bacterial cultures revealed powerful degumming of silk in the presence of toluene.

Several external conditions on the action of degummase was tested; optimum pH value was found to be 7.0~8.0 and optimum temperature was 40°C. The enzyme was sensitive to acid media, while it was rather stable to high temperature, since degummase was inactivated when it was kept at 65° for 2 hours.

Any noticeable decomposition of fibroin was not observed by the enzyme, although sericin A and B were attacked by degummase with very much the same rate.

Studies on Soya-been Oil-foots. (2)

Isolation of free Amino Acids
[Arginin, Aspartic-, Glutamic-, oxyglutamic Acid and etc.]

(pp. 248~250)

By Kozi OKANO and Iwao BEPPU.
(The Central Laboratory of the South Manchuria Railway Co., Received Dec. 21, 1937.)

We reported in the previous paper the composion of soya-bean oil-foots and two chief components which were stachyose and organic complex. In the present investigation we are able to isolate several kinds of free amino acids from the crude stachyose fraction. Namely the water solution of oil-foots is added with alcohol to bring about the concentration of alcohol at about 60%. At that conc. stachyose remains in solution and an organic complex settles down. Then the alcohol of the filtrate is evaporated off and is added successively with Pb-acetate and Hg-acetate at slightly alkaline and the precipitates at each time are separated off. So the latter is due to some amino acids, the ppt. is treated with H_2S to remove Hg and the filtrate is added with phosphotungstic acid. The ppt. thus formed is decomposed with $Ba(OH)_2$ after the ordinary method and arginine is obtained from this fraction. The filtrate from the ppt. is added with $AgNO_3$ and $Ba(OH)_2$ and the ppt. thus formed is decomposed with H_2S. Then glutamic acid is obtained as its HCl-salt, aspartic acid as its Pb-salt and oxyglutamic acid as its Ag-salt successively. From the filt. of above three amino acids an acid is obtained as free crystalline state. This amino acid is lactone and melts at 245°C and its analytical formula is $C_7H_{19}O_7N_3$. By the Van Slyke's method for amino nitrogen two atoms of nitrogen are liberated and by the titration at hot diluted alkaline solution and by the formal titration method two carboxyl radicals are proved. The ninhydrin and biurett reaction are given.

On Acid-Soil of Peculiar Behavior. (V)

(pp. 251∼262)

By S. Osugi and M. Aoki.

(Kyoto Imperial University. Received Dec. 14, 1937.)

1. The authors have already reported that formic, acetic and oxalic acids have been isolated in a distinct quantity from the acid-soil of peculiar behavior. Now, the result of investigation on the effect of these acids to the peculiarity of soil, shows that both of acetic and oxalic acid has a marked positive effect on this property and that formic acid shows nothing.

2. It was also experimented that for the most part of iron dissolved from the soil in paddy field condition, comes from ferric hydroxide, magnetite and ferric phosphate in the soil.

3. After standing the soil with dilute hydrochloric acid solution or with potassium chloride solution with HCl or KOH, ferrous iron and pH in the extract were determined.

By plotting the quantity of iron dissolved against pH, the authors obtained the curves which show that at every same pH value, KCl extracts more iron than HCl.

The above result shows that some part of iron dissolved, comes from the iron adsorbed by soil.

Chemische Untersuchung über die Bestandteile der Rosskastaniensamen. II Mitteil.

(ss. 263～272)

Von R. Sasaki und M. Kandatsu.

(Aus der Agrikulturchem. Institut d. Univers. Tokyo. Eingeg. am 17, Januer, 1938.)

Vitamin A Potency and Fatty Substances of Sukesodara and Aburatsunozame Eggs.

(pp. 273～276)

By Masanobu Yosida.

(Kawai Institute, Tokyo. Received Dec. 27, 1937.)

The Relation of the Composition of Liver Oil Fatty Acids to the Fishing Season of the Cod.

(pp. 277～283)

By Masanobu Yosida.

(Kawai Institute, Tokyo. Received Dec. 27, 1937.)

The cod liver oil having powerful vitamin A prepared in the spawning season and immediately thereafter, when the oil content of liver is most decreased, tends to be lower in the highly unsaturated acid content than that of feeble vitamin A potency rendered prior to spawning. As regards saturated acids no definite difference is recognized.

The liver oil of specially high vitamin A potency from the typical cod liver in spawning season, compared with the average one, contains greater amount of highly unsaturated acids, but smaller amount of saturated acids.

In "Ishinagi" liver oil, the same relation is also found.

The highly unsaturated fatty acid content in the depot fat of liver oil-fed rats decreases rapidly during fasting.

On the Correlation of the Organic and the Mineral Matters contained in Malberry Leaves. (2)

(pp. 284～288)

By K. Kato and S. Negi.

(The Sericultural Experiment Institute of Gifu Prefecture. Received Dec. 27, 1937.)

The writers have studied on the correlation of the organic and the mineral matters contained in malberry leaves, and reported following results. The quantity of K_2O,

P_2O_5 are correlated to the quantities of the raw protein and Na_2O to the soluble carbohydrate in sp. gr. 1.15 HCl, and the correlation co-efficient and probable error of correlation coefficient are as follows:

(a) Between raw protein and P_2O_5 $\gamma=0.67$ $E\gamma=0.09$
(b) Between raw protein and K_2O $\gamma=0.75$ $E\gamma=0.06$
(c) Soluble carbohydrate and Na_2O $\gamma=0.82$ $E\gamma=0.04$

From these correlations, the writers considered it was interesting to ascertain that carbohydrate or raw protein in malberry leaves were increased or not when P_2O_5, K_2O or Na_2O are manured in malberry-tree yard.

At the results of experiment, carbohydrate in malberryleaves is not increased when Na_2O (which is correlated to carbohydrate) is manured in soil, and on the contrary raw protein is increased. Protein is increased when P_2O_5 or K_2O are manured in soil respectively.

On the Contents of 0.2 NHCl Soluble Phosphoric Acid of Tyôsen Soils. (V)

(pp. 289～300)

By Dr. Misu-Hideo.

(Chemical Department, Agricultural Experiment Station of Government General of Tyôsen. Received Nov. 24, 1937.)

Chemical Studies of Green Tea. 2.

On the Saponin of Green Tea (1).

(pp. 301～308)

By Saichi Machida.

(Chemical Laboratory, Tokyo Agricultural College. Received Nov. 15, 1937.)

On the Fixation of Sericin of Raw Silk (Part III).

Deaminisation of sericin and fixation of deaminized sericin by chromium salts.

(pp. 309～317)

By Masami Oku and Zirô Hirose.

(From the Chemical Laboratory of Gunze Raw Silk Mfg. Co. Ltd., Ayabe-mati, Kyôto-hu. Received Dec. 20, 1937.)

As the theories of fixation of sericin can be interpreted as an inactivation of its hydrophilic groups, it may easily be supposed that sericin can be altered into a water stable state if its hydrophilic groups are inactivated. Thus, sericin may become even more insoluble against boiling water by further treatment with chromium salts.

In this report we have studied some influences of deaminization of sericin upon its fixation by chromium salts.

The experimental results were summarised as follows.

1) Raw silk becomes more insoluble against boiling water by deaminization.

2) Adsorption of Cr_2O_3 and SO_4 through deaminized raw silk occurs according to the formula' of Freundlich's adsorption isotherm and its adsorption amount decreases as compared with that of nondeaminized sericin.

3) Deaminized raw silk which is treated with chromium salts shows much more water stable than that merely chromed without deaminization.

4) Loss on deaminization and degree of nitrogen decrease of β-sericin are greater than those of α-sericin.

5) With exception of β-sericin with Cr_2O_3, combination of Cr_2O_3 and SO_4 with α- and β-sericin follow the formula of Freundlich's adsorption isotherm.

6) Both deaminized α- and β-sericin show smaller quantities of adsorption with Cr_2O_3 and SO_4 than those which are non-deaminized.

7) Deaminized β-sericin adsorbs more Cr_2O_3 and less SO_4 than deaminized α-sericin as was already observed in the case of non-deaminized sericin.

8) Fixation degree of deaminized α-chrome-sericinate becomes much more remarkable than those of deaminized β-chrome-sericinate but its effect due to chromination is greater in the case of deaminized β-sericin.

9) Deaminized chrome-sericinates become much more water stable than chrome-sericinates.

Chemical Studies on Japanese Coccidae. XVII.

On the Resinous Substance of Ceroplastes rubens
Mask. IIII.—Rubeabietic acid.
(pp. 318～328)

By M. Kawano and R. Maruyama.
(Laboratory of Ohsaka Factory of Sankyo Co., Ltd., Received Dec. 6, 1937.)

On the Contents of 0.2 NHCl Soluble Phosphoric acid of Tyôsen soils. (VI)

(pp. 329～341)

By Dr. Misu-Hideo.
(Chemical Department, Agricultural Experiment Station of Government General of Tyôsen. Received Nov. 24, 1937.)

Zuckerrohrwachs. II Mitteil.

Oxydationsversuche mit Zuckerrohrsitosterin.

(ss. 342～348)

Von Tetuo MITUI.
(Aus d. Agrikulturchem. Laboratorium d. Kaiserl. Universität, Kyoto.
Eigegangen am 5, 1, 1938.)

Mit Hilfe des bekannten Oxydationsverfahrens[1] mittels Chromsäure konnte ich aus Zuckerrohr-sitosterin drei wichtige Abkömmlinge gewinnen, nämlich trans-Dehydroandrosteron, 3-Oxy-Δ^5-bisnor-cholensäure und 3-Oxy-Δ^5-ätiobiliensäure. Die Schmelzpunkte dieser drei Stoffe und ihrer Derivate sind:

	Schmelzpunkt (unkorr.) nach d. Verfasser aus Zuckerrohr-sitosterin)	Schmelzpunkt nach Literatur (aus Cholesterin u. Stigmasterin)
trans-Dehydroandrosteron	140～141°	140～141°[1]
-acetat	168～169°	171～172°[1]
-acetat-semicarbazon	271～272°	275°[1]
3-Oxy-Δ^5-bisnor-cholensäure	295°	295°[2]
-methylester	137°	138°[2]
-acetat	231～232°	235°[2]
-methylesteracetat	135°	137°[2]
3-Oxy-Δ^5-ätiobiliensäure	247～248°	250°[3]
-dimethylester	109～110°	112°[3]
-dimethylesteracetat	150～151°	153°[3]

Auf Grund dieser Ergebnisse wurde festgestellt, dass Zuckerrohrsitosterin in seiner Konfiguration bis zur Kohlenstoffnummer 22 mit Cholesterin bzw. Stigmasterin identisch ist. Ausserdem möchte ich noch bemerken, dass Zuckerrohr-sitosterin, da es bei der Oxydation als primäres Abbauprodukt keine 3-Oxy-Δ^5-nor-cholensäure, sondern nur 3-Oxy-Δ^5-bisnor-cholensäure ergibt, eine Seitenkette

$$-CH(CH_3)CH_2CH(CH_3)CH(CH_3)CH(CH_3)_2$$

besitzt.

On the Unsaponifiable Matter of the Algae Fats, IV.

On the lipase activation as influenced by Pelvesterol.

(pp. 349～351)

By K. SHIRAHAMA.
(Agr. Chemical Laboratory, Hokkaido Imperial University, Japan. Received Dec. 2, 1937.)

As compared with other sterols (cholestrol, phytosterol, ergosterol and taurocholic acid natrium) the pelvesterol has a remarkable activity for the lipolytic action of pancreas lipase.

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1) Ruzicka u. Wettstein: Helv. **18**, 430 (1935).
Wallis u. Fernholz: J. Am. Chem. Soc. **57**, 1504 (1935).
Butenandt: Z. f. physiol. Chem. 237, 57 (1935).
2) Fernholz: Ann. **57**, 128 (1933).
3) Kuwada: J. pharm. Soc. Japan. **56**, 75 (1936).

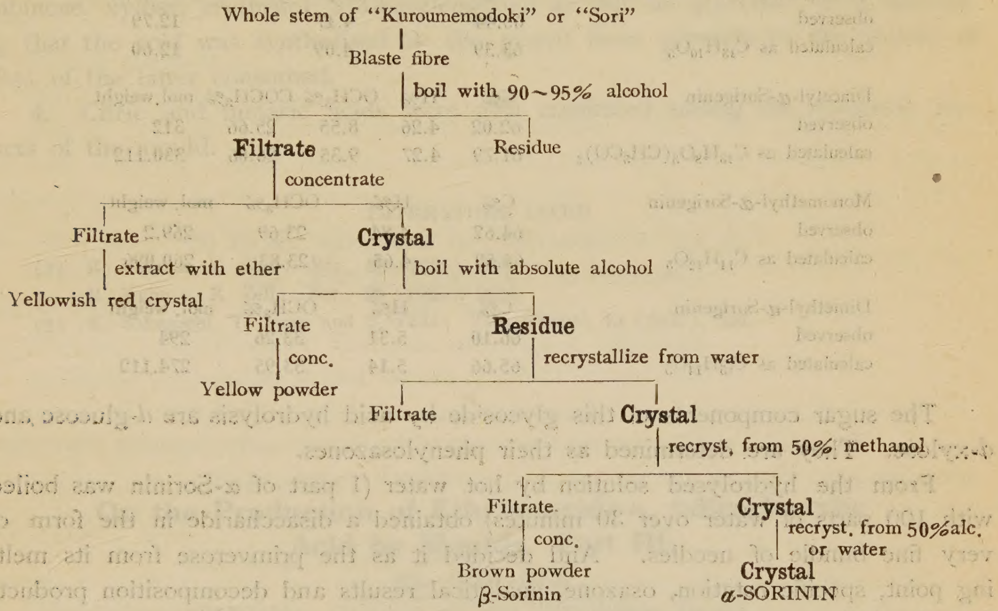
A New Glykoside from the Bark of Rhamnus japonica.

(pp. 352～361)

By Zirô NIKUNI.

(Agr. Chem. Laboratory, Tokyo Imp. Univ., Received January 21, 1938.)

The author obtained a crystalline glycoside from the bark of "Kuroumemodoki" (Rhamnus japonica Maxim.) under the following method, and named it "α-Sorinin" after the Chinese name of this tree "Sori".



The glycoside resembles to "Rhamnicoside" obtained from the bark of Rhamnus cathartica L. by M. Bridel (Compte rendu **180** (1925), 857, 1047, 1219), but differs from it on melting point and molecular formula. Especially the former lacks the Bornträger's reaction, which characterizes the Rhamnicoside.

This new glycoside "α-Sorinin" crystallizes in colorless needles or prisms, melts at 159° (uncorr.) and browns. It has a bitter taste and is soluble in hot water, boiling 50% ethyl and methyl alcohol and crystallizes out from these solutions on cooling, easily soluble in cold ammonia and other alkaline solutions.

On exposure to the sun the aqueous and alcoholic solution of this glycoside colors violet, red and then yellow. This coloration occurs almost instantly in alkaline solution.

The analytical results are as follows:

	C %	H %	OCH_3 %
observed	53.25	5.62	5.42
calculated as $C_{24}H_{28}O_{14}$	53.31	5.22	5.74

Upon hydrolysis with dilute mineral acids or boiling water, α-Sorinin yields an aglycon and sugars.

The aglycon "α-Sorigenin" is almost insoluble even in boiling water, slightly soluble in ethyl and methyl alcohol and more easily in boiling alcohol and cold pyridin. From alcohol it crystallizes out in slightly yellowish needles, melts at 227~229° and becomes brown. It colors also by sun light.

The constitution of this aglycon is now investigating. But the molecular formula is considered as $C_{13}H_{10}O_5$ by the analytical results of the aglycon and its several derivatives.

α-Sorigenin	C %	H %	OCH$_3$ %
observed	63.44	4.17	12.79
calculated as $C_{13}H_{10}O_5$	63.39	4.09	12.60

Diacetyl-α-Sorigenin	C%	H%	OCH$_3$%	COCH$_3$%	mol.weight
observed	62.02	4.26	8.55	25.66	312
calculated as $C_{13}H_8O_5(CH_3CO)_2$	61.79	4.27	9.35	26.06	330.112

Monomethyl-α-Sorigenin	C%	H%	OCH$_3$%	mol. weight
observed	64.62	4.84	23 69	269.2
calculated as $C_{14}H_{12}O_5$	64.59	4.65	23.83	260.096

Dimethyl-α-Sorigenin	C%	H%	OCH$_3$%	mol. weight
observed	66.10	5.31	33.26	294
calculated as $C_{15}H_{14}O_5$	65.66	5.14	33.95	274.112

The sugar components of this glycoside by acid hydrolysis are *d*-glucose and *d*-xylose. They are determined as their phenylosazones.

From the hydrolysed solution by hot water (1 part of α-Sorinin was boiled with 100 parts of water over 30 minutes) obtained a disaccharide in the form of very fine bundle of needles. And decided it as the primverose from its melting point, specific rotation, osazone, analytical results and decomposition products (namely *d*-glucose and *d*-xylose.)

Therefore α-Sorinin is showed as follows:

$$\underbrace{\underset{\alpha\text{-Sorigenin}}{C_{13}H_9O_4}\text{—O—}\underbrace{\underset{d\text{-glucose}}{C_6H_{10}O_4}\text{—O—}\underset{d\text{-xylose}}{C_5H_9O_4}}_{\text{primverose}}}_{\alpha\text{-Sorinin}}$$

The author expresses his sincere thanks to Prof. B. Suzuki for his kind guidance throughout this work.

On the Production of Ethylenoxide-α, β-2-Carboxylic Acid by Moulds. Part II.

(pp. 362~365)

Kinichirô SAKAGUCHI, Tatsuichiro INOUE and Seiji TADA.

(Tokyo Imperial University, Received Jan.8, 1938.)

1. *l*-trans-ethylenoxide-α, β-2-carboxylic acid, as described by R. Kuhn⁽¹⁾,

was synthesised from maleic acid by conversion into mono-brom-malic acid followed by debromination and dehydration; the resultant *d-l*-acid being separated into active forms through its morphin salt. Direct comparison of it with the acid obtained by the authors from the metabolism solution of a mould(2) showed that they are the same substance. A mixed melting point did not show any depression.

2. The effects of the temperature of the fermentation and the concentration of glucose in the medium upon the production of the acid were examined.

3. The acid was produced from sucrose, fructose, glucose, mannitol, sorbitol, arabinose, xylose, erythritol, 2-3-butylenglycol as well as glycerin. It is interesting that the acid was synthesised by the mould from glycerin to the extent of 5.8% of the latter consumed.

4. Citric and fumaric acids were also confirmed among the metabolic products of the mould.

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(1) R. Kuhn u. F. Ebel: Ber., **58** (1925), 919.
R. Kuhn u. R. Zell: Ber., **59** (1926), 2514.
(2) K. Sakaguchi, T. Inoue and S. Tada: This Journal, **13** (1937), 241.

On the Production of Ethylenoxide-α, β-dicarboxylic Acid by Moulds. Part III.

(pp. 366～373)

Kinichiro SAKAGUCHI and Tatsuichiro INOUE.

(Tokyo Imperial University, Received Jan., 8, 1938.)

In the present work taxonomic investigations on the organism which caused the new fermentation were carried out. It is obvious from the following descriptions that the mould may be classed in the genus Monilia.

The organism was isolated from a botanical specimen preserved in a dilute formaldehyde solution from Kagi, Formosa. Colonies on Koji-extract-agar light yellowish brown passing to greyish yellow in age (Pale Olive Buff to Dark Olive Buff, Cream Buff, Cartridge Buff, Honey Yellow, Citrine Drab or Camois according to media and age: Ridgway's Colour Standards, 1912, Washington), forming rather closely felted aerial masses 3～5 mm deep especially in the center. Reverse almost white or with some shades of yellow or orange (Antimony Yellow, Zinc Orange or Isabella Colour: Ridgway). Conidia smooth, light yellowish, mostly elliptic or somewhat spindle shaped and ovate or subglobose partly, 4～7 $\mu \times 1.5$～4 μ or 4～5 μ in diameter. Conidiophores not sharply distinguished from the hyphae of the vegetative mycelium which is colourless, septate, 3～5 μ in diameter.

The optimum temperature for growth near 35°C and the inhibition below 9∼12°C or above 47°C. Conidia are killed by heating at 62°C for 30 minutes or 65°C∼5 minutes. The optimum pH at near 5.1∼6.5. It grow readily on ordinary culture media for moulds such as Koji-extract, wort, Czapek's, Pfeffer's, Henneberg's, Hayduck's, Wöltje's solutions or the nitrite medium of Sakaguchi and Wang (this Jounal 10 (1934), 459). Against formaldehyde it is resistant up to 7% and grow well at 0.5%. Amylase, invertase, maltase, protease, lipase, lab-enzyme, urease, emulsin, catalase and zymase are formed. As its metabolic products laevo-rotatory ethylen-oxide-dicarboxylic, citric and fumaric acids as well as mannitol are found.

On the Production of Succinic Acid by Bacterium Succinicum nov. sp.

(pp. 374∼387)

Kinichiro Sakaguchi and Seiji Tada.

(Tokyo Imperial University, Received Jan., 8, 1938.)

1. The authors have isolated from a certain cheese a new bacteria which form abundant quantities of succinic acid from various organic acids.

Substrates	The yields of succinic acid	
	Against the quantities of substrates used.	Against the theoretical yields*
citric acid	57.83%	94.00%
d-tartaric acid	45.10	57.43
l-malic caid	25.04	28.44
fumaric acid	28.60	28.11

* On assuming that one molecule of succinic acid may be formed from each molecule of the substrates.

2. The properties of the new bacteria are as follows.

Bacterium succinicum nov. sp.

Morphology :–

Short rods, 1.3∼2.1 by 0.6∼0.8 μ, with rounded ends, occuring singly. Motile with peritrichous flagella. No endspore formation. Gram negative.

Cultural characteristics :–

Gelatin colonies : small, round, white, glistening and especially with greenish shimmer when young.

Gelatine stab : no liquefaction. Spreading all over the surface, very poor growth in depth.

Agar colonies and stab: similar to those on gelatine.

Broth: very turbid, with thin pericle and mucous sediments.

Litmus milk: acid, with coagulation. No peptonization.

Potato: scanty growth.

Cohn's, Uschinsky's or Czapek's solution: no growth.

Biochemical properties:–

Indol not formed.

Acetyl-methyl-carbinol not formed (Voges-Proskauer's and Omera's tests were used).

Nitrate reduced.

Hydrogen sulfide formed.

Methyl red test positive in glucose and lactose. Acid and gas in raffinose, trehalose, sucrose, lactose, maltose, glucose, fructose, galactose, mannose, xylose, arabinose and glycerin. Gas in sorbitol. Neither gas nor acid in starch, glycogen, dextrin, inulin, melecitose, dulcitol, salycin and erythritol.

Succinic, lactic and acetic acids, 2•3-butylenglycol and ethyl alcohol are formed from glucose.

Aerobic facultative.

Optimum temperature 33°C. Optim. pH 6.5~7.0.

3. General bacteriological investigations were carried out with known 17 strains of bacteria related to Bact. succinicum.

They were divided into four groups according to the modes of decomposition of citric acid.

	Rates of decomposition of citric acid	Quantities of the decomposition products of citric acid		
		succinic acid	acetic acid	formic acid
1st group	100%	up to 7%	60%	6~0.5%
2nd group	50	up to 7%	not formed	not formed
3rd group	50	trace or not formed	10%	trace or not formed
4th group	50	not formed	not formed	not formed
B. succinicum	100	up to 54%	20%	not formed

To the first group were found to belong two strains of Aerobacter oxytocum, three strains of Aerob. cloacae, Aerob. levans and Escherichia formicum; to the second Aerob. liquefaciens and Aerob. aeroegenes; to the third two strains of Esch. communior and to the fourth Esch. alve and Esch. ichthyosmia.

4. The conditions for the industrial production of succinic acid through the fermentation of citric acid by Bac. succinicum were studied in detail.

Action of a Green Fluorescent Substance Like Acetyl Flavin on Plants and Animals. (Part II.)

(pp. 388~391)

By Tetutaro TADOKORO and Tuneyuki SAITO.
(Hokkaido Imperial University, Japan. Received Jan. 14, 1938.)

On the Colouring Matter of Sugar Cane named Badilla.

(pp. 392~396)

By Yasuyosi OSIMA and Ryo YAMAMOTO.
(Agr. Chem. Dept., Taihoku Imp. Univ., Taiwan, Formosa.
Recieved Jan. 24. 1938.)

The authors have isolated the colouring matter from the bark of sugar cane named Badilla or N.G. 15, which was called "Ancha" and cultivated for food in Formosa.

The colouring matter was precipitated from methanol extract by lead acetate and decomposed by HCl-methanol. From the methanol extract thus obtained, colouring matter was precipitated by the adding of 5 to 6 volumes of ether. The crude pigment was purified by the solubility to methanol in four parts.

The colouring matter was reddish-violet powder and has no sugar and methoxyl group. Its chemical composition and colour reaction was very similar to cyanidin chloride but distinguished from the absorption spectra and it has changed to insoluble matter like phlobaphene by treatment of mineral acid.

The absorption spectra was much similar to the reduction product of quercetin by zinc dust and acetic anhydride but was differed from the reduction product by natrium-amalgam and cyanidin chloride isolated from Kuromame which belongs of Glycine Soja Benth.

Then the colouring matter of Sugar cane named Badilla was thought a substance like quercetylene chloride possibly according to the opinion of Nierenstein (J. Am. Chem. Soc., 52, 2864, 1930).